BRITISH COLUMBIA
MINISTRY OF FORESTS

Tree Farm Licence 8

Pope & Talbot Ltd.

Rationale for Allowable Annual Cut (AAC) Determination

Effective December 1, 2002

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Objective of this Document

This document is intended to provide an accounting of the factors I have considered and the rationale I have employed in making my determination, under Section 8 of the *Forest Act* (the Act), of the allowable annual cut (AAC) for Tree Farm Licence (TFL) 8. This document also identifies where I believe new or better information is needed for incorporation in future determinations.

Description of the TFL

TFL 8, held by Pope & Talbot Ltd. ('the licensee'), consists of 77 456 hectares of crown land and water located within the Boundary Forest District in the south central interior of British Columbia. The TFL is surrounded by the Okanagan Highlands and the Midway Range and is located near the communities of Grand Forks, Greenwood, Midway, Rock Creek, Westbridge and Beaverdell. The licence consists of two separate units, the "South Block" north of Greenwood and the "North Block" north of Beaverdell. Productive forest comprises 95 percent of the TFL and 87 percent of the productive forest contributes to the long-term Timber Harvesting Land Base (THLB).

Most of the productive forest occurs near 1 200 metres elevation. The climate is dry to sub-humid; summers are warm and winters cool and snowy. Annual rainfall ranges from 30 to 127 cm, increasing with elevation. Drought periods frequently exceed two months. Temperatures in July average 15°C, in January –9°C. Frosts can occur during the summer months at higher elevations. According to the provincial biogeoclimatic classification system, 49 percent of the productive forest is Montane Spruce (MS), 29 percent is Interior Douglas-fir (IDF), 14 percent Engelmann Spruce-Subalpine Fir (ESSF) and 8 percent Interior Cedar Hemlock (ICH). Douglas-fir, larch, lodgepole and ponderosa pine occur at lower and mid- elevations and lodgepole pine, spruce and balsam occur at higher elevations. Mule and white-tailed deer, moose, elk and black bear and many smaller mammals, birds and reptiles are prevalent either within the TFL or its surrounds.

History of the AAC

In 1951 the "South Block" was originally awarded to Boundary Sawmills Ltd. as TFL 8. The "North Block" was originally awarded to Olinger Lumber Company as TFL 11 in 1952. In 1967, the "North Block" was assigned to Boundary Sawmills Ltd. and became part of TFL 8. In 1970, Boundary Sawmills Ltd., Grand Forks Sawmills Ltd., Boundary Falls Lumber Co. Ltd., C & F Lumber Co. Ltd., and Fritz Sawmills Ltd., amalgamated to become Boundary Forest Products Ltd. Boundary Forest Products Ltd were in turn sold to Pope and Talbot Inc. In 1972 its Canadian operations were incorporated as Pope & Talbot Ltd. In 2000, Pope & Talbot Ltd entered into a 25 year replaceable TFL agreement with the Province.

After inclusion of both blocks within TFL 8, the AAC was set at 141 585 cubic metres in 1969. This was increased to 212 376 cubic metres in 1972 in response to beetle infestation and extensive blowdown. It was reset to the 1969 level in 1973. The AAC was again increased in response to beetle infestation in 1988 to 275 000 cubic metres. It was further increased in 1992 to 312 000 cubic metres. In 1994, the AAC was set at 145 000 cubic metres. This AAC was reduced in 1998 to 144 720 cubic metres to reflect a 163 hectare deletion from the TFL for a woodlot licence.

New AAC determination

Effective December 1, 2002, the new AAC for TFL 8 will be 175 000 cubic metres, an increase of 21 percent from the previous AAC.

This AAC will remain in effect until a new AAC is determined, which must take place within five years of this determination, unless in the meantime a decision is made under authority of the *Forest Act* to postpone the date of the next determination.

Information sources used in the AAC determination

Information considered in determining the AAC for TFL 8 includes the following:

- *Timber Supply Analysis Information Package for Tree Farm License 8*, Management Plan No. 10, Pope and Talbot Ltd., Boundary Division, accepted February 7, 2002
- Existing stand yield tables for TFL 8, accepted January 22, 2002;
- Managed stand yield tables and site index values, accepted January 22, 2002;
- *Potential Site Index Estimates for the Major Commercial Tree Species on TFL 8.* J.S. Thrower & Associates Ltd., March 30, 2001;
- *Yield Tables for Natural and Managed Stands: Management Plan 10 on TFL 8.* J.S. Thrower & Associates Ltd., dated September 11, 2001;
- *Timber Supply Analysis for TFL 8*, Pope and Talbot Ltd., Boundary Division, accepted May 21, 2002;
- TFL 8, Twenty-year Plan, Pope and Talbot Ltd., Boundary Division, accepted July 16, 2002;
- Management Plan No. 10: TFL 8, Pope and Talbot Ltd., Boundary Division, approved August 1, 2002.
- *Kootenay Boundary Land Use Plan (KBLUP),* Government of BC, 1995
- *Kootenay/Boundary Land Use Plan Implementation Strategy*, Kootenay Inter-Agency Management Committee, June 1997.
- *Kootenay-Boundary Higher Level Plan Order,* December 2000 and October 26, 2002.
- *Supplemental Guidelines for Forest Development Plans*, Boundary Forest District, April 2001.
- *Boundary Forest District, Dense Pine Management Inventory, Management Strategy,* Strathinness Forestry Consultants (Nelson) Ltd., March 1999.
- *Statistical Adjustment of Dense Lodgepole Pine Polygons in the Boundary Forest District,* Version 2, J.S. Thrower and Associates Ltd., June 1999.
- Letter from the Minister of Forests to the Chief Forester, dated July 28, 1994, stating the Crown's economic and social objectives.
- Memorandum from the Minister of Forests to the Chief Forester, dated February 26, 1996, stating the Crown's economic and social objectives regarding visual resources.

- Letter from the Deputy Ministers of Forests, and Environment, Lands and Parks, dated August 25, 1997, conveying government's objectives regarding the achievement of acceptable impacts of biodiversity management on timber supply.
- Memorandum from the Director of the Timber Supply Branch of the Ministry of Forests, dated December 1, 1997, titled *Incorporating Biodiversity and Landscape Units in the Timber Supply Review*.
- *Forest Practices Code of British Columbia Act*, consolidated to March, 2001.
- *Forest Practices Code of British Columbia Act Regulations and Amendments*, current as of April 2001.
- Forest Practices Code of British Columbia Guidebooks, British Columbia Forest Service (BCFS) and Ministry of Water, Land and Air Protection (MWLAP).
- Technical information provided through correspondence and communication among staff from the BCFS and MWLAP.
- Landscape Unit Planning Guide, BCFS and MWLAP, March 1999.

Role and limitations of the technical information used

Section 8 of the *Forest Act* requires the chief forester to consider biophysical as well as social and economic information in AAC determinations. A timber supply analysis, and the inventory and growth and yield data used as inputs to the analysis, typically form the major body of technical information used in AAC determinations. Timber supply analyses and associated inventory information are concerned primarily with biophysical factors—such as the rate of timber growth and definition of the land base considered available for timber harvesting—and with management practices.

However, the analytical techniques used to assess timber supply are necessarily simplifications of the real world. There is uncertainty about many of the factors used as inputs to timber supply analysis due in part to variations in physical, biological and social conditions, although ongoing science-based improvements in the understanding of ecological dynamics will help reduce some of this uncertainty.

Furthermore, technical analytical methods such as computer models cannot incorporate all of the social, cultural and economic factors that are relevant when making forest management decisions. Therefore, technical information and analysis do not necessarily provide complete answers or solutions to forest management problems such as AAC determinations. The information does, however, provide valuable insight into potential impacts of different resource-use assumptions and actions, and thus forms an important component of the information required to be considered in AAC determinations.

In determining the AAC for TFL 8, I have considered known limitations of the technical information provided, and I am satisfied that the information provides a suitable basis for my determination.

Statutory framework

Section 8 of the *Forest Act* requires the chief forester to consider particular factors in determining AACs for timber supply areas (TSAs) and TFLs. Section 8 is reproduced in full as Appendix 1.

In accordance with Section 23(3) of the *Interpretation Act*, the deputy chief forester is expressly authorized to carry out the functions of the chief forester which include those required under Section 8 of the *Forest Act*.

The chief forester has expressed the importance of consistency of judgement in making AAC determinations. I also recognize the need for consistency of approach. I have observed the chief forester during a number of previous AAC determinations and am familiar with the guiding principles that the chief forester has employed in making AAC determinations. I find these principles to be reasonable and appropriate and I have adopted them as described below in making my AAC determination for TFL 8.

Guiding principles for AAC determinations

Rapid changes in social values and in our understanding and management of complex forest ecosystems mean that there is always some uncertainty in the information used in AAC determinations. When a large number of determinations are made for many forest management units over extended periods of time, administrative fairness requires a reasonable degree of consistency of approach in incorporating these changes and uncertainty. To make his approach in these matters explicit, the chief forester has compiled a set of guiding principles for AAC determinations. I have reviewed these principles and find them to be reasonable, and thus I have adopted and applied them as deputy chief forester in AAC determinations for TFLs. These principles are set out below. If in some specific circumstance I believe it is appropriate to deviate from these principles, I will provide a detailed reasoning in the considerations that follow.

Two important ways of dealing with uncertainty are:

(i) minimizing risk, in respect of which in making AAC determinations, I consider the uncertainty associated with the information before me, and attempt to assess the various potential current and future social, economic and environmental risks associated with a range of possible AACs; and

(ii) re-determining AACs frequently, to ensure they incorporate current information and knowledge, a principle that has been recognized in the legislated requirement to re-determine AACs every five years. The adoption of this principle is central to many of the guiding principles that follow.

In considering the various factors that Section 8 of the *Forest Act* requires the chief forester to take into account in determining AACs, I attempt to reflect as closely as possible operability and forest management factors that are a reasonable extrapolation of current practices. It is not appropriate to base my decision on unsupported speculation with respect either to factors that could work to increase the timber supply—such as optimistic assumptions about harvesting in unconventional areas, or using unconventional technology, that are not substantiated by demonstrated performance—or to factors that could work to reduce the timber supply, such as integrated resource management objectives beyond those articulated in current planning

guidelines or the *Forest Practices Code of British Columbia Act* and its associated regulations (the Forest Practices Code).

The *Forest Practices Code of British Columbia Regulations* were approved by the Lieutenant Governor in Council on April 12, 1995, and released to the public at that time. The *Forest Practices Code of British Columbia Act* was brought into force on June 15, 1995.

Although the Forest Practices Code has been fully implemented since the end of the transition period on June 15, 1997, the timber supply implications of some of its provisions, such as those for landscape-level biodiversity, still remain uncertain, particularly when considered in combination with other factors. In each AAC determination the chief forester takes this uncertainty into account to the extent possible in the context of the best available information. In making my determination for TFL 8, as deputy chief forester, I have followed the same approach.

More recently, on November 21, 2002, government passed the new *Forest and Range Practices Act*, which will ultimately replace the *Forest Practices Code of British Columbia Act*. As the timber supply implications of this new Act and any pursuant regulations become clear and measurable, they will be accounted for in AAC determinations. Uncertainties will continue to be handled as they were under the previous legislative regime.

As British Columbia progresses toward completion of strategic land-use plans, the timber supply impacts associated with the land-use decisions resulting from the various planning processes are important to AAC determinations. Where specific protected areas have been designated by legislation or by order in council, these areas are no longer considered to be part of the timber harvesting land base or to contribute to the timber supply in AAC determinations.

Because the outcomes of planning processes are subject to significant uncertainty until formal approval by government, it has been and continues to be the position of the chief forester that in determining AACs it would be inappropriate to attempt to speculate on the timber supply impacts that will eventually result from land-use decisions that have not yet been taken by government. I consider this approach to be reasonable and appropriate. Like the chief forester, I will therefore not take into account the possible impacts of existing or anticipated recommendations made by such planning processes, nor attempt to anticipate any action the government could take in response to such recommendations.

Moreover, even where government has made a formal land-use decision, it may not always be possible to fully analyze and account for the consequent timber supply impact in a current AAC determination. In many cases, government's land-use decision must be followed by a number of detailed implementation decisions. For example, a land-use decision may require the establishment of resource management zones and resource management objectives and strategies for these zones. Until such implementation decisions are made, it would be impossible to fully assess the overall impacts of the land-use decision. Nevertheless, the legislated requirement for five-year AAC reviews will ensure that future determinations address ongoing plan implementation decisions.

A number of intensive silviculture activities have the potential to affect timber supply, particularly in the long term. As with all components of an AAC determination, like the chief forester, I require sound evidence before accounting for the effects of intensive silviculture on possible timber supply. Nonetheless, I will consider information on the types and extent of planned and implemented practices as well as relevant scientific, empirical and analytical evidence on the likely magnitude and timing of any timber supply effects of intensive silviculture.

Some have suggested that, given the large uncertainties present with respect to much of the data in AAC determinations, any adjustments in AAC should wait until better data are available. I agree that some data are not complete, but this will always be true where information is constantly evolving and management issues are changing. Moreover, in the past waiting for improved data created the extensive delays that resulted in the urgency to re-determine many outdated AACs between 1992 and 1996. In any case, the data and models available today are improved from those available in the past, and will undoubtedly provide for more reliable determinations.

Others have suggested that, in view of data uncertainties, the chief forester should immediately reduce some AACs in the interest of caution. However, any AAC determination made by the chief forester or myself must be the result of applying our individual judgement to the available information, taking any uncertainties into account. Given the large impacts that AAC determinations can have on communities, no responsible AAC determination can be made solely on the basis of a response to uncertainty. Nevertheless, in making my determination, I have made allowances for risks that arise because of uncertainty.

Overall, in making this AAC determination, as the deputy chief forester, I am mindful of the mandate of the Ministry of Forests as set out in Section 4 of the *Ministry of Forests Act*, and of the chief forester's responsibilities under the *Forest Practices Code of British Columbia Act* and the *Forest Act*.

Guiding principles with respect to First Nations

With respect to First Nations' issues, I am aware of the Crown's legal obligations, particularly as clarified in judgements by the Supreme Court of Canada and the British Columbia Court of Appeal. The AAC that I have determined should not in any way be construed as limiting those obligations under these decisions, and in this respect it should be noted that my determination does not prescribe a particular plan of harvesting activity within TFL 8.

The British Columbia Court of Appeal decided in March 2002 the Crown has an obligation to consult with First Nations with respect to asserted rights and title in a manner proportional to the apparent strength of the interests. As a matter of course, I consider any information brought forward by all parties respecting First Nations' interests. In particular I consider information related to actions taken to protect interests, including operational plans that describe forest practices designed to address First Nations' interests. In this context, I re-iterate that my AAC determination does not prescribe a particular plan of harvesting activity, nor does it involve allocation of the wood supply to any particular party.

Subsequent to a determination, if I become aware of information respecting First Nations interests that would substantially alter my understanding of relevant circumstances, I may revisit my determination sooner than as required by the Forest Act.

The role of the base case

In considering the factors required under Section 8 of the *Forest Act* to be addressed in AAC determinations, I am assisted by timber supply forecasts provided to me through the work of the Timber Supply Review program for TSAs and TFLs.

For each AAC determination for a TFL, a timber supply analysis is carried out using an information package including data and information from three categories—land base inventory, timber growth and yield, and management practices. Using this set of data and a computer model, a series of timber supply forecasts is produced, reflecting different starting harvest levels, rates of change over time, and potential trade-offs between short- and long-term harvest levels.

From this range of forecasts, one is chosen which attempts to avoid excessive changes from decade to decade and significant timber shortages in the future, while ensuring the long-term productivity of forest lands. This is known as the 'base case' forecast, and forms the basis for comparison when assessing the effects of uncertainty on timber supply.

Because it represents only one in a number of theoretical forecasts, and because it incorporates information about which there may be some uncertainty, the base case forecast for a TFL is not a portrayal of AACs over time. Rather, it is one possible forecast of timber supply, whose validity—as with all the other forecasts provided—depends on the validity of the data and assumptions incorporated into the computer simulation used to generate it. In some cases, an AAC is determined that coincides with the base case starting point. In other cases, an AAC is determined which differs significantly from the modelled starting point.

Therefore, much of what follows in the considerations outlined below is an examination of the degree to which the assumptions made in generating the base case forecast are realistic and current, and the degree to which its predictions of timber supply must be adjusted, if necessary, to more properly reflect the current situation.

These adjustments are made on the basis of informed judgement, using current available information about forest management, which may have changed since the original information package was assembled. Forest management data are particularly subject to change during periods of legislative or regulatory change, or during the implementation of new policies, procedures, guidelines or plans.

Thus it is important to remember, in reviewing the considerations which lead to the AAC determination, that while the timber supply analysis with which I am provided is integral to those considerations, the AAC determination itself is not a calculation but rather is a synthesis of judgement and analysis and judgement in which numerous risks and uncertainties are weighed. Depending upon the outcome of these considerations, the AAC determined may or may not coincide with initial harvest level in a base case forecast. Judgements that may be based in part on uncertain information are essentially qualitative in nature and, as such, are subject to an element of risk. Consequently, once an AAC has been determined, no additional precision or validation may be gained by attempting a computer analysis of the combined considerations to confirm the exact AAC determined.

Timber supply analysis

The timber supply analysis for TFL 8 was prepared by Timberline Forest Inventory Consultants (Timberline) under the direction of licensee staff. Timberline used its proprietary timber supply model "Critical Analysis by Simulation of Harvesting" version 6 (CASH6). This model can be used to produce either spatially-explicit or spatially-implicit timber supply forecasts. The spatial relationships between cutblocks are tracked in a spatially explicit simulation. They are modelled using forest cover constraints in a spatially implicit simulation. The latter mode was used in this

analysis. Based upon my staff's experience in examining results from the CASH6 model, and my experience with previous AAC determinations where this model was used to conduct the analyses, I am satisfied that it can provide reasonable projections of timber supply.

The timber supply analysis incorporated assumptions based on the licensee's assessment of the best available information on current forest management, land base and timber yields for the TFL. These assumptions are discussed in the information package, and in the timber supply analysis documentation which form an integral component of the licensee's Management Plan Number 10.

In this rationale, I will discuss many of those analysis assumptions in the context of my considerations for this AAC determination. However, where I have reviewed an assumption and concluded that I am satisfied it was appropriately modelled in the base case, I will not discuss my considerations in detail in this document, other than to note my agreement with the approach that is already documented in the licensee's analysis report and information package. Even though they were appropriately modelled, I will discuss other factors for the reasons mentioned in the relevant section of this document.

The licensee provided a timber supply analysis based on an initial harvest level of 163 535 cubic metres per year for six decades, increasing to a long-term level of 208 100 cubic metres per year. For the purposes of this document, I have labelled this as 'Scenario A'.

The licensee also provided a different scenario wherein a harvest flow of 205 600 cubic metres per year could be sustained for 11 decades before increasing to 211 150 cubic metres per year in the 12th decade. I have labelled this as 'Scenario B'. Over the 250-year planning horizon Scenario B would yield approximately 3 million cubic metres more than Scenario A, while respecting the same set of harvesting constraints as applied in Scenario A.

Sensitivity analyses performed to explore uncertainty around the assumptions underpinning Scenario A were not meaningful because they were overwhelmed by the large quantity of projected surplus inventory. Harvest flows and sensitivity analyses using Scenario B as a frame of reference did prove meaningful. I therefore decided to adopt Scenario B as the base case for this determination. I have accepted the licensee's assertion that the assumptions underlying this scenario adequately reflect current management practices on TFL 8, subject to the observations made throughout this document. The sensitivity analyses and alternate flows compared to the base case have informed my considerations described below, which led to my determination.

Consideration of Factors as Required by Section 8 of the *Forest Act*

Section 8 (8)

In determining an allowable annual cut under subsection (1) the chief forester, despite anything to the contrary in an agreement listed in section 12, must consider

(a) the rate of timber production that may be sustained on the area, taking into account

(i) the composition of the forest and its expected rate of growth on the area,

Land base contributing to timber harvesting

- general comments

The licensee's inventory file was used to identify the timber harvesting land base (THLB) for TFL 8. The THLB is defined as the land base estimated to be biologically and economically available for harvesting. It is identified by making a series of deductions from the productive forest land base. These deductions account for the factors that effectively reduce the suitability or availability of the productive forest area for harvest for ecological or economic reasons. For TFL 8, the deductions result in a current timber harvesting land base of 65 919 hectares, or approximately 90 percent of the productive forest land.

The current timber harvesting land base (THLB) is 1 261 hectares or approximately 1.9 percent larger than that assumed at the time of the previous determination. The change in size of the current timber harvesting land base is due to improved mapping of both the total productive land base and areas to be excluded from harvest.

I have considered all of the deductions applied in the derivation of the timber harvesting land base for TFL 8. I accept without further discussion the exclusions applied for non-forested areas, operability, non-productive areas, non-commercial brush areas, deciduous stands, areas with regeneration difficulties, and existing and future roads, trails and landings.

Where I believe an assumption in the base case is incorrect, or does not represent current practice, or where I believe a factor requires discussion, it is presented in the following sections of this rationale.

- terrain stability

Areas of potential terrain instability were mapped and partially excluded from the timber harvesting land base in the analysis. The licensee used environmentally sensitive area (ESA) data in combination with terrain stability data to derive land base reductions to account for sensitive or unstable soils. Land mapped as Es1 (highly sensitive to soil disturbance) was excluded from the THLB. Areas typed as Es2 (moderately sensitive to soils disturbance) were not excluded from the THLB because harvesting has occurred within this type without detrimental impacts to the soil resource.

The licensee had completed detailed terrain stability mapping on 12 percent of the TFL. The remainder of the TFL was covered by reconnaissance-level terrain stability mapping. This combination of mapping was used to identify and remove unstable terrain from the THLB not deducted previously as Es1.

The licensee used both ESA and terrain stability mapping because it had not yet compared the two systems to determine if the new terrain stability mapping indeed reflects all terrain stability concerns.

In my view, the partial use of broad scale ESA mapping to identify unstable terrain, when finer scale detailed terrain stability mapping was available, may result in an underestimate of the THLB. I will take this into account in the determination and will discuss terrain stability further under *'Reasons for decision'*.

- low productivity/non merchantable

The licensee used the definition of low productivity stands documented in the TSR2 Boundary TSA timber supply analysis report to identify such stands within the TFL.

Non-merchantable forest types were determined by estimating the predicted volume at 120 years of age and applying a 100 cubic metre per hectare minimum. To predict volumes, the licensee used the Ministry of Sustainable Resource Management's Variable Density Yield Prediction (VDYP) estimates, and the relevant inventory site index and species composition.

The licensee believed volume predictions alone were not enough to identify non-merchantable stands; in addition it considered its operational experience regarding expected rot, pulp component and piece size.

BCFS district staff have reviewed the licensee's definition of low productivity and non-merchantable stands and find it acceptable. While I agree that these stands do not provide an economic harvest opportunity, the post-harvest site index adjustments discussed later in this document suggest a portion of currently identified "low productivity" stands, if harvested would provide an economic harvest opportunity at rotation. I will take this into account in the determination and will discuss low productivity stands further under *'Reasons for decision'*.

- dense lodgepole pine stands

In the 1996 analysis, the licensee excluded dense lodgepole pine stands identified as problem forest types from the THLB. Using current utilization standards, the licensee identified and included in this analysis 8 558 hectares of dense lodgepole pine stands as physically operable. In the model, these stands become managed stands with higher yields after being harvested, and account for approximately 13 percent of the long-term THLB. The licensee acknowledged that despite their physical operability some of the dense lodgepole pine stands would only be economically operable under favourable market conditions. I agree with the licensees assessment and consider the economic operability of marginal lodgepole pine stands to be a significant uncertainty on timber supply. I will discuss this further under '*Reasons for decision*'.

- small patches

The 20 year plan shows 7 785 hectares in patches less than three hectares in size. I believe many of these small patches are an artifact of the modelling, resulting from overlaying the many mapping layers used in the timber supply analysis. In practice, because almost all of the TFL area is considered operable and accessible, I anticipate that the number of unharvested small patches will be significantly less than modelled. Furthermore, the licensee will likely utilize some of the actual unharvested small patches, as Wildlife Tree Patches (WTPs) or for contributing to connectivity corridors. The licensee and District staff believe, nevertheless, that some will prove to be uneconomic to harvest and will be retained even though they are not explicitly contributing to the required amount of retention. I will discuss my consideration of the small patch issue further under '*Reasons for decision*'.

Existing forest inventory and unmanaged stand yields

The inventory audit of TFL 8 showed no significant difference between inventory and audit volumes. VDYP was used to predict current and future volumes for all stands currently greater than 25 years of age. I am satisfied both the inventory and future volumes for unmanaged stands represent the best available information and form an acceptable basis for this determination.

Expected rate of growth

- site productivity estimates

Inventory data include estimates of site productivity for each forest stand, expressed in terms of a site index. The site index is based on the stand's height as a function of its age, and the productivity of a site largely determines how quickly trees grow. This in turn affects the time seedlings will take to reach green-up conditions, the volume of timber that can be produced, and the ages at which a stand will satisfy mature forest cover requirements and reach a merchantable size.

In general in British Columbia, site indices determined from younger stands (i.e., less than 31 years old), and older stands (i.e., over 140 years old) may not accurately reflect potential site productivity. In young stands, growth often depends as much on recent weather, stocking density and competition from other vegetation, as it does on site quality. In old stands, which have not been subject to management of stocking density, the trees used to measure site productivity may have grown under intense competition or may have been damaged, and therefore may not reflect the true growing potential of the site. This has been verified in several areas of the province where studies—such as the old-growth site index (OGSI) project—suggest that actual site indices may be higher than those indicated by existing provincial inventory data from old-growth forests. Studies include those known as 'paired-plot'—where plot samples from an old-growth stand and the adjacent second-growth stand are compared—and a provincial veteran tree study. It has been consistently concluded from such studies that site productivity has generally been underestimated; managed forest stands tend to grow faster than projected by inventory-based site index estimates from old-growth stands.

The licensee believes the inventory file for TFL 8 underestimated site productivity for second-growth forests. To address this concern, the licensee computed "potential site index" (PSI) estimates for each site series, species combination on the TFL. These PSI estimates were applied to all existing managed stands and all future managed stands. Prior to harvest the model applied the relevant inventory site index.

Estimation of PSI required the licensee to acquire site series level Terrain Ecosystem Mapping (TEM) at the site series level. The TEM and the inventory Forest Cover (FC) mapping were combined and a preliminary site index estimate was assigned to each resultant TEM/FC polygon. These preliminary site index estimates were then adjusted using the ratio of the average preliminary site index (by species) for the population in question and the average site index (by species) computed from a statistically robust ground sample of the same population.

BCFS Timber Supply Branch staff have reviewed the site index estimates and find their application to MS, IDF and ICH stands acceptable. I agree with this assessment.

The situation is different in the ESSF biogeoclimatic zone, which covers 14 percent of the productive forest land in the TFL. Here the harvest history has been mostly limited to the lower elevations. Within the ESSF , the preliminary site index estimates for lodgepole pine were adjusted using published height growth-elevation relationships for spruce and balsam developed using data not specific to the TFL. Due to limited harvesting at higher elevations within the ESSF the licensee's efforts to validate this elevation model for application to pine were severely hampered. Like BCFS Timber Supply Branch staff, I believe there is uncertainty around the site index estimates for pine within the ESSF and I have taken this into account in this determination. I will discuss my considerations further under *'Reasons for decision'*.

- volume estimates for regenerating stands

The licensee modelled three different silviculture systems: clearcutting, patch-cutting and single tree selection. The "Table Interpolation Program for Stand Yields" (TIPSY) was used to model yields for all stands clearcut and regenerated within the past 25 years. It was also used to model yields for all future stands that result from clearcutting.

According to the licensee, most clearcut and regenerated stands 14 years of age or greater were established without genetically improved seed and the majority were juvenile spaced. The majority of stands less than 14 years of age were regenerated with genetically improved seed and were not juvenile spaced. Timber Supply Branch staff concluded the TIPSY derived yield curves adequately represented the use of genetically improved seed and juvenile spacing of regenerated stands on the TFL.

The patch cuts prescribed by the licensee are one hectare in size or less. All trees within the patch are harvested and the patch is regenerated as an even-aged stand. Simulations with the "Tree and Stand Simulator" (TASS) suggest the reduction in growth caused by shading from the surrounding stand on regeneration established within a one hectare patch cut would be approximately seven percent. TIPSY, with a seven percent reduction applied over and above standard OAFs (see next section), was used to model the regenerating patch. This reduction factor was derived in consultation with Research Branch and Timber Supply Branch staff.

With single tree selection, trees from all size classes within a stand are removed to promote constant recruitment of merchantable stems over time. This silviculture system will also mitigate the impacts of harvesting on habitat and visual resources. The licensee estimated single tree selection harvest volumes and the resultant cutting cycles using the proprietary stand level model—SINGROW. BCFS Timber Supply Branch staff reviewed the model and determined the licensee did not over-estimate the harvest volumes, nor underestimate cutting cycles.

Concurring with Research and Timber Supply Branch staff, I believe the predicted managed stand yields are adequate for my determination.

- operational adjustment factors

TIPSY projections are initially based on ideal conditions, assuming full site occupancy and the absence of pests, diseases, and significant brush competition in the stand. Certain operational conditions, such as less than ideal tree distribution, small non-productive areas, endemic pests and diseases, or age dependent factors such as decay, waste, and breakage cause actual yields to be less than the theoretical TIPSY yields over time. Operational adjustment factors (OAFs) are applied to yields generated using TIPSY to account for losses of timber volume resulting from these operational conditions. OAF1 accounts for factors affecting the yield curve across all ages, including small stand openings, tree distribution, endemic pests, and other factors. OAF2 accounts for decay, waste, and breakage. The provincial defaults for OAF1 and OAF2 are 15 and 5 percent respectively. These defaults were not used in the analysis.

The licensee explicitly identified very small non-productive areas when TEM mapping the TFL. These very small non-productive areas were not identified during the forest cover mapping. The licensee factored these areas into the OAF1s that ranged from 15.1 in the MS to 17.0 percent in the IDF.

The licensee used the OAF2 values documented in the TSR2 Boundary TSA timber supply analysis report as a baseline. These baseline values were increased to reflect expected growth

losses due to the root diseases *Armilaria ostoyae* and *Phellinus weirri*, which are endemic to the TFL. Growth losses due to root disease were expected to be higher than baseline values in both managed and unmanaged stands with a significant component of Douglas fir and/or subject to juvenile spacing.

BCFS, TSB staff reviewed the OAFs used by the licensee and determined they were reasonable. I accept their findings for this determination.

- minimum harvestable ages and harvest sequencing

In timber supply analysis, estimates are made of the earliest age at which a forest stand has reached a harvestable condition or has met minimum merchantability criteria. The assumptions largely affect when second-growth stands will be available for harvest in the model. The licensee assumed minimum merchantability would be attained when a stand reached 95 percent of culmination mean annual increment. The modelled minimum harvest ages range from 60 to 160 years for the more extensive lodgepole pine stands.

In practice, many forest stands will be harvested later than the age at which they reach minimum merchantability. Economic considerations and management for other forest values such as visual quality, wildlife habitat and water quality may delay the harvest.

The licensee conducted a sensitivity analysis to show the impact on timber supply of increasing and decreasing the theoretical minimum harvest age by 20 percent. Decreasing the minimum harvest age by 20 percent permitted an increase in the harvest forecast to 210 100 cubic metres per year for 11 decades followed by a decrease to 199 300 cubic metres per year in the 12th decade. Increasing the minimum harvest age by 20 percent resulted in decreases in the fifth and seventh decades from the base case to 184 950 cubic metres per year and 169 450 cubic metres per year respectively. The forecast then increased to 205 600 cubic metres per year in the 10th decade and 216 100 cubic metres per year in the 12th decade.

Having considered the impact of changing minimum harvest age on timber supply, in the next timber supply analysis, I ask the licensee to present the average piece size or diameter harvested (as a surrogate) by decade. This will enable me to assess the type of fibre the licensee expects to harvest in future decades.

The simulated sequence of harvest was to cut the oldest stand that satisfies the minimum harvest age requirements. If the oldest merchantable stand was unavailable due to integrated resource management (IRM) objectives, the model chose the next oldest stand of merchantable age.

Having considered the minimum harvest age and harvest sequence assumptions, I accept that the methodologies for determining those ages and order of harvest were reasonable, and I make no adjustments on this account. I am aware that minimum harvest age assumptions are always somewhat uncertain due to the difficulties associated with projecting future practices and market demand. Further, I accept that determining a realistic sequence of harvesting stands, in a simulation, is problematic. Nonetheless I accept the modelling rule — "cut the oldest available stand first" — is a reasonable representation of anticipated management.

(ii) the expected time that it will take the forest to become re-established on the area following denudation,

Expected time for forest to be re-established following harvest

I have reviewed the assumptions in the base case regarding expected time to establish regeneration on harvested blocks and the area of not-satisfactorily-restocked (NSR) blocks within TFL 8. I am satisfied that the assumed times to establish regeneration on harvested blocks reflect current practice on the TFL and form a suitable basis for my determination. The assumptions regarding the area of NSR land are discussed below.

- not satisfactorily restocked areas

The base case implies the licensee will harvest approximately 700 - 900 hectares per year. The licensee assumes blocks will be regenerated within one year if planted or two years if natural seeding is relied upon. This implies a NSR area of 1 800 hectares at most on the TFL. However, the licensee's forest cover inventory indicates 2 698 hectares of NSR blocks exist currently on the TFL. According to the licensee, the discrepancy is due to incorrectly classifying some partially cut stands as NSR. I will take this into account in the determination and discuss the incorrect classification of some partially cut stands as NSR further under *'Reasons for decision'*.

(iii)silvicultural treatments to be applied to the area,

Silvicultural treatments to be applied

- silviculture systems

In the base case the licensee assumed three silviculture systems are applied on TFL 8. Clearcutting, patch cutting and single tree selection would be used on 83 percent, 11 percent and 6 percent of the long-term THLB respectively. The patch cutting and single tree selection systems have been used, and will continue to be used, to provide access to timber within mule deer winter range areas. Clearcut systems are also used within mule deer winter range areas, but only on wetter sites.

These three silviculture systems and their growth and yield implications have been discussed under the section titled *"volume estimates for regenerating stands"*. District staff concur with the licensee's assumptions. I am satisfied that the silviculture assumptions used in the base case reflect current practice and form a reasonable basis for this determination.

- use of select seed / genetic improvement

The Forest Practices Code requires the use of the best genetic quality (seed and vegetative material) source available for regeneration. Select seed produced from seed orchards is the product of B.C.'s forest gene resource management program, which uses traditional tree breeding techniques to select naturally-occurring, well-adapted, healthy and vigorous trees.

Select seed from seed orchards produces trees that grow faster than seed from natural stands. As a result, a stand composed of such trees has a greater volume at a given age than does a natural stand with the same species composition. Current expectations are that the volume differences will begin to decrease beyond a certain stand age.

In the base case, consistent with past practices, no genetic gain was assumed for regenerated stands 14 years of age and greater. If available, the licensee used planting stock from select seed to regenerate some stands younger than 14 years of age. According to the licensee's silviculture database, to date 9 165 hectares have been regenerated using select seed. The proportion of select seed used to regenerate future stands is assumed to be the same as the proportion assumed for existing stands less than 14 years of age. The increases in expected yields are consistent with those expected within the Thompson / Okanagan and Nelson seed planning zones.

BCFS Timber Supply Branch staff have accepted the modelled genetic gains. I concur with their assessment and will make no further adjustment in the determination to account for genetic gains.

- juvenile spacing and fertilization

Most regenerated stands 14 years or older were juvenile spaced; most younger stands were not. Fertilization has not been practised on TFL 8. I have reviewed this information and I am satisfied that current practice was appropriately reflected in the base case. I accept the information as the best available, and consider it suitable for use in this determination.

(iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area,

Timber harvesting

- utilization standards and compliance

Utilization standards define the species, dimensions and quality of trees that must be harvested and removed from an area during harvesting operations. In timber supply analysis, the utilization specification defines the minimum merchantable tree size and the portion of a tree that contributes volume to the harvest level.

In the base case, the utilization standards assumed for all species except lodgepole pine were a minimum 17.5-centimetre diameter at breast height (dbh) with volume calculated from a 30-centimetre maximum stump height to a 10-centimetre minimum top diameter inside bark. The standard assumed for lodgepole pine was a 12.5-centimetre dbh minimum, a 30-centimetre maximum stump height and 10-centimetre minimum top diameter inside bark.

BCFS District staff advise that the utilization standards assumed in the base case reflect current operational practice on the TFL. I agree with this assessment and as a result I will I make no adjustments for this determination.

- decay, waste and breakage

I have reviewed the information regarding the decay, waste and breakage in existing stands on TFL 8, and I am satisfied that the best available information was used in the base case. I accept the assumptions as suitable for this determination.

(v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production,

Integrated resource management objectives

The Ministry of Forests is required under the *Ministry of Forests Act* to manage, protect and conserve the forest and range resources of the Crown and to plan the use of these resources so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are co-ordinated and integrated. Accordingly, the extent to which integrated resource management objectives for various forest resources and values affect timber supply must be considered in AAC determinations.

In addition to the requirements under the *Ministry of Forests Act,* the management of TFL 8 must be consistent with the objectives of the *Kootenay-Boundary Higher Level Plan Order* (KBHLP Order). The original order dated January 31, 2001 was replaced by a revised order on October 26, 2002. The base case modelled the objectives of the original order and impacts of changes in the revised order were addressed via sensitivity analyses. IRM objectives common to both Orders are as follows:

- the assignment of biodiversity emphasis to each landscape unit;
- retention targets for both old and mature forest;
- measures to address caribou habitat;
- specific green-up requirements;
- maintenance of mature and old-growth forest next to avalanche tracks for grizzly bear habitat and maintenance of connectivity corridors;
- constraints on logging practices to protect consumptive use streams;
- the establishment of "enhanced resource development zones" where the emphasis is on timber production;
- restoration of fire-maintained ecosystems; and
- establishment of scenic areas.

With respect to timber supply on TFL 8, the difference between the two orders is discussed under *-landscape-level biodiversity*.

No caribou habitat or grizzly bear habitat including avalanche tracks have been identified on the TFL and therefore those elements of the Order need not be considered in this determination. Those IRM objectives that do pertain to the management of TFL 8 are discussed in the following sections.

- ungulate winter range

Though not legally binding, the Kootenay Boundary Land Use Plan—Implementation Strategy (KBLUPIS) provides guidance on the management of ungulate (i.e., Mule deer) winter range. The intent of the KBLUPIS with regard to mule deer winter range is to manage disturbance patterns and forest cover to minimize displacement of mule deer due to timber harvesting and mortality due to poaching.

Mule deer ungulate winter range (UWR) was mapped in 1994 and updated to 1998. The mule deer winter range area was identified in the August 1998 memo--"Procedures for Identifying and

Approving Existing Ungulate Winter Ranges" jointly signed by the Ministry of Forests and then Ministry of Environment, Lands and Parks.

Within UWR areas, clear cutting is only practised on wet sites where partial cutting is not appropriate due to root disease. On all other sites within UWR areas, patch cuts or single tree selection is utilized. Patch cuts have been limited to a maximum of one hectare in size.

The licensee modelled a disturbance requirement within UWR areas allowing no more than 25 percent of the area to be covered by stands less than 2.5 metres in height. KBLUPIS mature cover requirements were only modelled in sensitivity analyses, not the base case. Depending upon the forest ecosystem, mature forest is comprised of stands either greater than 100 years old or greater than 120 years old. Specified minimum retention levels range from 15 to 35 percent. The impact of applying mature forest requirements on timber supply was negligible.

Ministry of Water, Land and Air Protection (MWLAP) staff have reviewed the modelling of the licensee's activities within mule deer winter range areas and conclude that the assumptions used reflect current practice. I concur with the conclusion of the MWLAP staff and I am satisfied that the assumptions used in the base case and sensitivity analyses form an adequate basis for this determination.

- identified wildlife

Under the Forest Practices Code of British Columbia Act, identified wildlife are those wildlife species that have been approved by the chief forester and deputy minister of Environment, Lands and Parks or designate as requiring special management. The province's Identified Wildlife Management Strategy (IWMS) was announced on February 19, 1999. It deals with endangered, threatened, vulnerable, and regionally significant species which have not been accounted for with existing management strategies—such as those for biodiversity, riparian management, ungulate winter range or through the application of other forest cover constraints.

In general, identified wildlife species will be managed through the establishment of wildlife habitat areas (WHAs) and implementation of general wildlife measures (GWMs), or through other management practices specified in higher level plans.

Government policy is to limit the impact of management for identified wildlife to a maximum of one percent of the short-term harvest level for the province. When WHAs are identified or established across the province, and GWMs are implemented, the impacts on timber supply of management for identified wildlife will be more quantifiable. In addition, measures will be assessed over time to determine if they are sufficient to adequately protect the identified wildlife species. The identified wildlife strategy and associated timber supply impact thresholds may be changed after such an evaluation, but I cannot speculate on the outcome of this process. In addition, I cannot speculate about decisions that may be made during future land and resource management planning processes with respect to identified wildlife. Any future changes to the required measures for identified wildlife species which result in impacts to timber supply, either under the IWMS or according to approved plans, will be incorporated into future determinations.

Identified wildlife inventories within the TFL are incomplete and no wildlife habitat areas (WHAs) have been declared within the TFL. However, MWLAP staff believe the South Block of TFL 8 has the richest identified wildlife species presence within the TFL and should be the focus of WHA placements over the next five years.

The following species of identified wildlife may reside or breed in the South Block of TFL8: Lewis' woodpecker, great blue heron, white-headed woodpecker, flammulated owl, Williamson's sapsucker, grasshopper sparrow, wolverine, fringed myotis, California bighorn sheep, tiger salamander, Northern leopard frog, tailed frog, yellow-bellied racer and the Great Basin gopher snake.

Currently, MWLAP staff plan to identify 20- to 50-hectare WHAs around sapsucker nesting sites and further "Sapsucker Enhancement Zones" up to 200 hectares in size within which single tree selection should be practised. MWLAP staff recommend heavy seed tree retention should be the silviculture system of choice adjacent to known sapsucker nesting sites. According to MWLAP staff, the licensee often practises larch seed tree retention within the south block. Hence MWLAP's recommendations should not significantly conflict with the licensee's current operational practices.

MWLAP staff believe WHAs should also be placed around known flammulated owl sites.

Despite the probable establishment of WHAs for management of identified wildlife within the South Block, no WHAs have been established to date. It is therefore difficult to quantify the implications for timber supply. I believe some WHAs will in all likelihood be established on TFL 8 having a minimal long-term impact on timber supply. I will discuss this further under *'Reasons for decision'*.

- riparian habitat

Riparian habitats occur along streams and around lakes and wetlands. The Forest Practices Code requires the establishment of riparian reserve zones (RRZs) that exclude timber harvesting, and riparian management zones (RMZs) that restrict timber harvesting in order to protect riparian and aquatic habitats. For each stream, lake or wetland, the RRZ and RMZ make up the entire riparian management area. Stream riparian classes are described in the *Riparian Management Area Guidebook* and are determined based on presence of fish, occurrence in a community watershed and average channel width criteria.

Streams with fish or within community watersheds are typed as "S1" through "S4" with the following respective channel width breakpoints: 20, 5 and 1.5 metres. All other streams are typed as "S5" if the channel width is 3 metres or wider, or "S6" if the channel width is less than 3 metres. The stream class is used to estimate the area required to be retained in the RRZ and the area or volume to be retained in the RMZ. Similar criteria are used to classify lakes and wetlands.

The licensee classified all streams within the TFL consistent with the guidebook utilizing the expertise of a fisheries specialist. The resulting total area reduction for stream, lakeshore and wetland riparian reserves zones was 1 960 hectares. The maximum retention within the RMZs according to the guidebook was 25 percent. This percentage was modelled in the base case. While licensee staff were comfortable that this retention level reflected operational practice, District staff believe actual retention levels were less on average. I concur with BCFS District staff that modelling 25 percent retention in the base case would likely result in an under-estimate of timber supply.

Although not modelled as such in the base case, the licensee has agreed with the BCFS to manage S6 streams greater than 1.5 metres in channel width as if they were S4 streams. The impact of this agreement on management is to increase the no-machine buffer width on either side of the stream channel from 5 to 10 metres. Further, retention of co-dominant (upper canopy) trees is increased

from 20-30 trees per hectare to 80-120 tree per hectare. The omission of this management practice from the base case has caused a small over-estimate in timber supply.

There are a small unspecified number of water licences on TFL 8. Some of these may draw from S5 and S6 streams. Although the KBHLP ORDER requires S5 and S6 streams licensed for human consumption to be managed in a more conservative manner, the impact on timber supply will be negligible.

The licensee indicated its Geographic Information System was used to sum the length of channel by stream category. MWLAP staff believe the length of stream channel classified as "S4" was excessive though they did not provide data to this effect.

The concern of MWLAP staff regarding excessive classification of "S4" streams and use of 25 percent retention levels in combination lead me to believe timber supply has been under-estimated. As a result, I will make adjustments for this factor in my determination and discuss this further under *'Reasons for decision'*.

- *visual quality objectives*

Visual quality objectives (VQOs) identify the level of denudation that would be acceptable on a viewscape. They also provide measurable criteria for estimating timber availability and rate of harvest in timber supply analyses. Recommended VQOs are developed by visual landscape staff at the time a visual landscape inventory is completed. VQOs are established under the Code through higher level plans or by the District Manager of the MoF. VQOs seek to balance the perceptions of the viewing public with the social and economic needs of the province.

Objective 9 of the KBHLP Order has identified scenic areas and requires forest managers to conserve the quality of views from communities, major waterways and major highways. District managers in the Nelson Forest Region have made a commitment to establish VQOs within the mapped scenic areas for the KBHLP Order within a three-year period.

As an interim measure, the maximum level of acceptable denudation within each VQO zone was determined by following the methodology described in the BCFS 1998 report "Procedures for Factoring Recreation Resources into Timber Supply Analyses".

In the VQO context, a stand is no longer considered denuded once it has reached visually effective green-up height, which is the stage at which a cutblock is perceived by the public as being newly established forest. The cover on the cutblock must generally be of sufficient height to block stumps, logging debris and bare ground from view.

The green-up heights assumed in the base case are consistent with those specified in the KBLUPIS. The licensee performed a sensitivity analysis to demonstrate the impact of varying the maximum acceptable level of denudation within a VQO by 5 percent and found timber supply was not sensitive to these changes.

BCFS TSB and district staff have reviewed the licensee's methodology for modelling visuals and have concluded VQOs were modelled adequately in the base case. I agree with their assessment and will take no further account of VQOs in the determination.

- landscape-level biodiversity

Achieving landscape-level biodiversity objectives involves maintaining forests with a variety of patch sizes, seral stages, and forest stand attributes and structures, across a variety of ecosystems and landscapes. A major consideration in managing for biodiversity at the landscape level is leaving sufficient and reasonably located patches of old-growth forests for species that are dependent on, or are strongly associated with, old-growth forests. Although some general forest management practices can broadly accommodate the needs of most ecosystems, more often a variety of practices are needed to represent the different natural disturbance patterns under which ecosystems have evolved.

The delineation and formal designation of 'landscape units' is a key component of a sub-regional biodiversity management strategy. A landscape unit is an area established by the district manager, generally up to 100 000 hectares in size, based on topographic or geographic features such as a watershed, or series of watersheds, to manage biodiversity and other forest resource values.

Landscape unit boundaries have not yet been established for TFL 8. However draft landscape unit boundaries were available, and were used in the base case. Three draft landscape units intersect the TFL—the "Rock", "Boundary" and "Trapping". The KBHLP Order has specified the level of biodiversity emphasis to be placed across landscape units by natural disturbance type (NDT) and biogeoclimatic (BEC) zone.

TFL 8 is composed of the following array of NDTs:

- 0.4 percent NDT 2 – moist warm ICH forest ecosystems which seldom experience stand replacing events such as fire;
- 70 percent NDT 3 – drier ICH, MS and ESSF forest systems subject to frequent stand initiating events such as fire, insect outbreaks and/or root disease; and
- 29.6 percent NDT 4 – the IDF ecosystems naturally subject to frequent stand-maintaining fires.

Provincial priorities for landscape unit planning are retention of old-growth forest and retention of wildlife tree patches within stands to maintain structure. The original KBHLP Order specifies not only a minimum amount of old-growth to be retained, in addition it specifies a minimum amount of mature forest plus old-growth in combination to be retained. The revised Order limits the latter requirement to specific landscape units that don't intersect the TFL. The licensee developed the base case before the revised order was proclaimed.

The Order defines old-growth as being forest greater than 140 years of age within the NDT 3 (ecosystems with frequent stand initiating events), and greater than 250 years of age in all other NDTs. Mature forest is defined as being greater than either 100 or 120 years of age, depending on the natural disturbance type and biogeoclimatic zone.

Within the "Boundary" and "Trapping" landscape units the biodiversity emphasis option (BEO) is low. Within the "Rock" landscape unit (9 percent of the TFL), 47 percent is delineated as high BEO and 53 percent as intermediate BEO. In total then, 91 percent of the TFL area carries a low BEO. Areas with a low BEO have lower retention requirements of old-growth and mature-plus-old forest do areas with an intermediate or high BEO. The requirements for retaining old-growth and mature-plus-old forest were modelled in the base case.

Often the current forest estate will not meet the stated retention targets. In intermediate and high BEO areas, the deficits in mature and/or old-growth forest must be overcome in the shortest

possible time frame. In low BEO areas, an old-growth deficit can be ameliorated over three rotations while any mature deficit must be remedied in the shortest possible time. The licensee elected to recruit old growth over three rotations in the base case, starting with one-third of the old-growth requirement stated in the KBHLP Order. The licensee could not model such a recruitment strategy explicitly using the timber supply model "CASH6". Instead the recruitment strategy was approximated by iteration. In the base case, any deficits in old growth were met by the end of the third rotation in all but one NDT/BEC unit covering seven percent of the TFL. The old-growth retention requirement for that unit was 14 percent and 11 percent was achieved.

The licensee conducted a sensitivity analysis to show the impact on timber supply of eliminating the old-growth deficit within the low BEO areas in the shortest possible time. This reduced the timber supply from the base case to an even flow of 186 600 cubic metres per year.

The revised Order and the removal of the mature plus old forest constraint from the landscape units that intersect the TFL was anticipated when the timber supply analysis was done. The licensee therefore assessed the impact of deleting the "mature-plus-old" requirement. Of itself, this change was forecast to increase across the planning horizon by eight percent relative to the base case.

BCFS TSB staff reviewed the output of the model and confirmed that, within the limitations of the timber supply model, the mature-plus-old forest retention requirements were modelled satisfactorily. I am satisfied the modelling analysis of landscape-level biodiversity retention forms an adequate basis for this determination.

- *stand-level biodiversity*

The management of stand-level biodiversity includes the retention of wildlife trees and patches within or adjacent to cutblocks to provide structural diversity and wildlife habitat. The *Landscape Unit Planning Guide* specifies the rate of retention within cut blocks dependent upon whether or not landscape units have been designated and landscape-level biodiversity objectives established. In the case of TFL 8, the plan is to set wildlife tree objectives concurrently with the establishment of landscape-level biodiversity objectives.

The rate of WTP retention is specific to each subzone within the landscape unit. It varies with the proportion of the subzone within the landscape unit that is available for harvest and the proportion of the THLB that has been already harvested without the deployment of the WTPs. Within the THLB, WTPs were modelled as a volume reduction rather than an area reduction. The percentage reduction in volume was proportional to the percentage of the cutblock expected to be covered by WTPs.

Consistent with the *Landscape Unit Planning Guide*, the licensee assumed 50 percent of the required WTPs could be established in areas not available for harvest. MWLAP staff believe it may not be possible to achieve 50 percent of the WTP requirements from outside cutblocks because 90 percent of the productive forest is operable. I concur with their opinion and will account for it in my determination, though I conclude it is not an issue that poses a short-term risk to timber supply.

(vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber,

Other information

I note that, as with all timber supply analyses, the application of assumptions in the analysis such as those around harvest sequencing, do not drive operational planning. In the context of AAC determinations, the timber supply analysis assumptions are meant to reflect current operational practices, and forest practitioners should not base on-the-ground operations on assumptions made in the analysis.

- twenty-year plan

The licensee prepared a twenty-year plan to provide an assessment of the operational feasibility of Scenario A. However, it did not prepare a twenty-year plan for the forecast which I have adopted as the base case. Given the stability of the timber supply over many decades, I am nevertheless comfortable that the licensee would have no difficulty crafting a twenty-year plan based on the AAC I have determined, which is 7 percent greater than the volume indicated in Scenario A for the first twenty years.

- First Nations considerations

BCFS district staff sent the information package and timber supply analysis to the each of the following First Nations: Lower Similkameen; Upper Similkameen; Okanagan; Osoyoos; Penticton; Spallumcheen; Upper Nicola; and Westbank. Westbank is the only First Nation contacted to have lodged a "statement of intent" with the British Columbia Treaty Commission covering most of the North Block of TFL 8. Each First Nation was invited in writing to provide its interests and concerns to the deputy chief forester for his consideration during his determination. Further, district staff offered to meet with First Nations representatives to answer questions and discuss concerns the First Nations had with these documents and arrange attendance of appropriate government and licensee representatives.

Only the Westbank First Nation responded to this invitation. They did so in a letter dated July 29, 2002 and no meeting to discuss their interests and concerns was requested nor held. In this letter to the Arrow-Boundary District Manager the Westbank First Nation stated that the lands and resources of TFL 8 form part the statement of intent filed with the British Columbia Treaty Commission. The Westbank First Nation further stated that renewals of existing usage of lands and resources within its territory must include a mandate by the government of British Columbia to recognize and accommodate aboriginal title. District staff responded to Westbank's letter on November 4, 2002 stating that the deputy chief forester would consider their interests and concerns in his AAC determination and suggesting that the First Nation discuss its concerns over the treaty process with staff from the Ministry of Attorney General.

I note that the Westbank First Nation has entered into an "Interim Measures Agreement" (IMA) with the Province of British Columbia effective September 23, 2002. This IMA invites the Westbank First Nation to apply for a Community Forest Pilot Agreement (CFPA) over an area of Crown Land, within the Okanagan TSA, that would represent a volume of timber harvested of up to 55 000 cubic metres per year. The Okanagan TSA is immediately west of TFL 8. This agreement requires the Westbank First Nation to submit an acceptable business and management plan to the Province of British Columbia. At the time of writing this rationale, the Province and Westbank First Nation have yet to enter into the CFPA.

The licensee indicated that over the past six years it has sought input from First Nations regarding its Forest Development Plans (FDP). Each band belonging to the Okanagan First Nation was sent copies of each FDP and asked for its interests and concerns regarding the proposed operations. When the last FDP was advertised in 2001 all the Okanagan First Nations were invited to meet with the licensee and discuss their interests and concerns; only the Spallumcheen First Nation agreed to attend. The licensee has ascertained through its various meetings with local First Nations that some of TFL 8 lies within their traditional use areas.

I understand that the Osoyoos First Nation (OFN) was the only First Nation that pursued a relationship with the licensee over the past six years. The relationship has been economic rather than focussed on traditional use. The OFN has undertaken juvenile spacing contracts, and fish and fish habitat inventory work for the licensee. In addition, the licensee has sold the OFN large dry spruce logs to feed the OFN's primary breakdown mill.

I am satisfied that district and licensee staff consulted with local First Nations to enable First Nations interests to be considered in my determination. After considering the information available to me, including that provided from the consultation process, I am not aware of any information that indicates that First Nations interests will be negatively impacted by my AAC determination for TFL 8. Further, the nature, scope, and geographical location of potential aboriginal rights and title within TFL 8 remain inconclusive. If further information on aboriginal interests becomes available during the term of this determination, I will consider it in a future determination, or re-examine my determination, if warranted.

- Kootenay Boundary Higher Level Plan Order

Portions of plans arising from strategic land-use planning processes such land and resource management planning may be declared as binding higher level plans under the Forest Practices Code. A higher level plan establishes government's social, economic and environmental objectives, thereby setting the resource management context for developing subsequent operational plans.

For the West Kootenay area, the Kootenay Boundary Land Use Plan (KBLUP) was completed and adopted as government policy in 1995. The Kootenay-Boundary Higher Level Plan Order (KBHLP Order) was promulgated by government in December, 2000, and as mentioned under '*landscape-level biodiversity*', was revised in October, 2002. Because the Order is legally binding, TFL 8 must be managed according to its provisions, as recently amended.

I am satisfied that the timber supply analysis has adequately modelled the implications of the KBHLP Order. In particular, I am informed by the licensee's estimation of the impact of having repealed the earlier requirement to retain certain amounts of mature timber. If, however, it should become evident that implementing the Order is having a significant impact on timber supply, which I have not anticipated, I will consider re-determining the AAC before the five-year deadline specified by the Forest Act.

(b) the short and long-term implications to British Columbia of alternative rates of timber harvesting from the area,

Alternative rates of harvest

- harvest flow/socio-economic implications

The nature of the transition from harvesting old-growth forests to harvesting second-growth forests is a major consideration in determining AACs in many parts of the province. In the short

term, the presence of large timber volumes in older forests often permits harvesting above long-term levels without jeopardizing future timber supply. In keeping with the objectives of good forest stewardship, AACs in British Columbia have been and continue to be determined to ensure that current and medium-term harvest levels will be compatible with a smooth transition toward the usually (but not always) lower long-term harvest level. Thus, timber supply should remain sufficiently stable so that there will be no inordinately adverse impacts on current or future generations. To achieve this, the AAC determined must not be so high as to cause later disruptive shortfalls in supply nor so low as to cause immediate social and economic impacts that are not required to maintain forest productivity and future harvest stability.

As discussed in the section titled *Timber Supply Analysis*, the licensee's analysis that I have labelled Scenario A adopted an initial harvest level of 163 535 cubic metres per year for six decades, increasing to a long-term level of 208 100 cubic metres per year. I noted that this scenario did not allow meaningful sensitivity analyses to be conducted. The licensee provided an alternative harvest flow (scenario B) using the assumptions underlying scenario A and I adopted scenario B as the base case. To reiterate, for scenario B a maximum, non-declining even flow harvest level of 205 600 cubic metres per year was maintained for 11 decades followed by an increase to 211 150 cubic metres per year in the 12th decade for the remainder of the 250 year planning horizon. Other than Scenario A, no other alternative harvest flows using base case assumptions were provided.

I am aware that other harvest flows are possible given the assumptions underlying the base case. I also note that the short-term harvest levels for both harvest flow alternatives represent significant increases from the current AAC. Based upon my review and discussions with BCFS staff, I conclude that the initial harvest level modelled in the base case approximates the highest possible level given the non-declining, even-flow parameter and other assumptions applied and I have used this as a point of reference in my determination.

- alternative management scenarios

Two alternative management scenarios were requested by BCFS Boundary Forest District staff to address uncertainty regarding thermal requirements for ungulate winter range and the area of dense pine stands that will prove to be economically operable. Both alternatives assumed the same initial harvest rate as the base case.

The first alternative included the following assumptions:

- full application of the KBLUPIS forest cover guidelines;
- conversion of NDT4 areas to open forest condition;
- removing one-half of the 8 558 hectares of dense pine stands that contribute to the THLB in the base case;
- changing the old-growth requirements to reflect the amount of old growth available within the entire Boundary forest district rather than just the TFL; and
- maintaining the mature forest retention requirements used in the base case but prohibiting the use of the "one-third draw down" in cases of current old-growth deficits.

Under this scenario, the initial harvest rate of 206 600 cubic metres per year could only be maintained for one decade before it declined to 185 000 cubic metres per year in the second decade and 175 658 cubic metres per year in the fourth decade. This harvest rate was maintained until the 10th decade when it increased to 195 600 cubic metres per year.

The second alternate flow included the same assumptions as the first, except that the requirement to retain mature forest was removed. The initial harvest rate of 206 600 cubic metres per year could be maintained for two decades before it declined to 195 275 cubic metres per year. This harvest rate was maintained until the 12th decade when it increased to 211 150 cubic metres per year.

I note that both alternatives indicate initial harvest levels virtually identical to the base case, but unlike the base case, they indicate declining supply after one or two decades. I have considered these alternatives in my determination.

- community dependence on the forest industry

Based on 1996 Census figures, forestry and wood-related processing jobs account for approximately 26 percent of total employment in the Boundary area. In 1999, Statistics Canada reported average weekly earnings (before taxes) within the forest sector to be $935. The only sector with higher weekly earnings was mining, which employs fewer people.

In 1996, BCFS Economics and Trade Branch staff estimated the average employment associated with the then AAC (which is the same as the current AAC) to be 170 to 195 person years and that provincial forestry revenues from the TFL totalled approximately $4 861 000.

Logs harvested from TFL 8 supply the licensee's two sawmills at Midway and Grand Forks. Nearly 100 percent of the employees at the Grand Forks mill reside within the Grand Forks area. However, only approximately 50 percent of the employees at the Midway facility reside in Midway. The remainder commute from other communities including Grand Forks, Beaverdell and Osoyoos.

I am aware that the harvest from TFL 8 contributes significantly to both provincial and community economies, and I have considered this information in my determination.

(c) the nature, production capabilities and timber requirements of established and proposed timber processing facilities,

Timber processing facilities

As mentioned in the previous section, the TFL supplies logs to the licensee's mills at Midway and Grand Forks. The Grand Forks facility can process up to 306 000 cubic metres per year, the Midway facility 550 000 cubic metres per year. The Grand Fork mill has typically operated for one shift per day while the Midway mill has typically operated for two shifts per day. Both mills produce machine stress rated (MSR), kiln dried, random length, dimension lumber for the North American market. Approximately 90 percent is sold into the United States with the remainder sold domestically. By-products from the two mills include chips, planer shavings and hog fuel, which are sold to other manufacturing facilities in the region.

I have considered this information in my determination.

(d) the economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for British Columbia,

Economic and social objectives

- Minister's letter and memorandum

The Minister has expressed the economic and social objectives of the Crown for the province in two documents to the chief forester—a letter dated July 28, 1994, (attached as Appendix 3) and a memorandum dated February 26, 1996, (attached as Appendix 4). These economic and social objectives are an important consideration in my determination of an AAC for TFL 8.

This letter and memorandum include objectives for forest stewardship, a stable timber supply, and allowance of time for communities to adjust to harvest-level changes in a managed transition from old-growth to second-growth forests, so as to provide for community stability.

The Minister stated in his letter of July 28, 1994, that "any decreases in allowable cut at this time should be no larger than are necessary to avoid compromising long-run sustainability." He placed particular emphasis on the importance of long-term community stability and the continued availability of good forest jobs. To this end he asked that the chief forester consider the potential impacts on timber supply of commercial thinning and harvesting in previously uneconomical areas. To encourage this the Minister suggested consideration of partitioned AACs.

I have considered the contents of the letter and memorandum in my determination of the AAC for TFL 8. I note, however, that timber supply for TFL 8 appears to be increasing over time, not decreasing, and I see no significant value in a partitioned AAC at this time.

The Minister's memorandum addressed the effects of visual resource management on timber supply. In it, the Minister asked that pre-Code constraints applied to timber supply in order to meet VQOs be re-examined when determining AACs in order to ensure they do not unreasonably restrict timber supply. Having reviewed the information regarding visual resources, I am satisfied that the constraints applied in the analysis were an appropriate reflection of management considerations necessary to maintain the quality of the visual resource.

- local objectives

The Minister's letter of July 28, 1994, suggests that the chief forester should consider important social and economic objectives that may be derived from the public input in the timber supply review where these are consistent with government's broader objectives.

The licensee provided opportunity for public review at a number of stages in the process for Management Plan No. 10, including the advertisement of the draft management plan in the Grand Forks and Greenwood local newspapers consistent with the Regional Manager's direction. No open house was held, though the documents were made available for public viewing from various offices. First Nations excepted, no public input was received. The input from First Nations is discussed under - *First Nations considerations*. I have reviewed the process used by the licensee to solicit public input and I am satisfied that it has met its obligations satisfactorily.

(e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.

Abnormal infestations and salvage

- unsalvaged losses and salvage program

Unsalvaged losses are timber volumes destroyed or damaged by agents such as fire and disease that are not recovered through salvage operations. Unsalvaged losses accounted for in the base case include those attributable to fire, insects and windthrow. Historical values and recent salvage experience were used to estimate unsalvaged losses. The greatest sources of unsalvaged losses were windthrow down at 596 cubic metres per year, and insect attack — mountain pine beetle, Douglas fir bark beetle and spruce bark beetle — at 215 cubic metres per year. Although the majority of the TFL is comprised of either fire-prone or fire-dependent ecosystems, the unsalvaged loss to fire has averaged only 14 cubic metres per year.

A total of 900 cubic metres per year were subtracted from the harvest forecast for the entire forecast period. The base case projection is net of this provision. Although root disease is an issue, losses due to root disease have been factored into the operational adjustment factors applied to the yield curves.

In reviewing the information about unsalvaged losses and the assumptions used in the analysis I note that the TFL is well roaded allowing easy detection and salvage. Like BCFS district staff, I am satisfied that the best available information was used in the timber supply analysis, and make no adjustments for this determination.

Reasons for decision

I have considered the information discussed throughout this document, and I have reasoned as follows.

For the reasons stated in 'Timber Supply Analysis' I have concluded the licensee's projection which I labelled Scenario A was not a meaningful frame of reference for this AAC determination. Instead, I have chosen as the base case the alternative forecast with an initial harvest level of 205 600 cubic metres per year, rising to 211 150 cubic metres per year. I believe it is the most appropriate basis from which to assess timber supply for TFL 8.

In determining this AAC, I have identified factors which, considered separately, indicate that the timber supply may be either greater or less than that projected in the base case. Generally some of these factors can be quantified and their impacts assessed with some reliability. Others may influence timber supply by adding an element of risk or uncertainty to the decision but cannot be reliably quantified at this time. These latter factors are accounted for in more general terms.

In this rationale, I have identified several factors for which I believe the base case assumptions differ from current operational practices or conditions. These factors are summarized below.

I believe the treatment of two factors have under-estimated timber supply in the base case in the mid- to long term, as follows:

- *mature plus old seral stage constraint* – The changes to the KBHLP Order regarding elimination of the mature plus old constraint on some areas including TFL 8 resulted in an increased timber supply of approximately eight percent over the forecast period.

- *riparian management zones* – I believe that modelling of retention within riparian management areas at the 25 percent maximum level does not represent typical operational practice. Further, I concur with MWLAP staff that the classification of streams as S4 was likely excessive. I conclude that the combination of these two factors has under-estimated timber supply by approximately two percent.

I believe that the treatment of other factors have over-estimated timber supply in the base case projection, as follows:

- *small patches* – I believe a significant number of small patches will be created across the landscape over time, that will neither be logged nor contribute to the required quantum of wildlife tree patches. As a result, I believe that the base case modelling has over-estimated timber supply by three or four percent;

- *dense pine* – I conclude that the economic operability of the 8 558 hectares of dense lodgepole pine stands is highly uncertain. If the sites in question are of inherently average productive capacity in the long run, and if only half of that area proves to be economically inoperable, which I think is possible, the base case has over-estimated long-term timber supply by about seven percent;

- *wildlife habitat areas* – No WHAs have been established on the TFL 8 to date. However, I believe that WHA placements are highly likely on the South Block over the next five years given the richness of wildlife and the stated intentions of MWLAP staff. I conclude timber supply has therefore been over-estimated by approximately half a percent;

- *wildlife tree patches* – Due to the very high proportion of the TFL that is operable, I do not expect that half of the WTP requirements will be met from the portion of the land base that is otherwise unavailable for harvest. I conclude that the base case has over-estimated timber supply by about two percent on this account.

Although they are not quantified, I am mindful of several other considerations, which are significant in this decision:

- *terrain stability* – I believe the use of both terrain stability and soil ESA mapping in the net-down process has the potential for double counting, resulting in a non-quantifiable under-estimate in timber supply.

- *low productivity/non merchantable* – A portion of the stands defined in the analysis as inoperable due to low productivity may currently contain adequate volume to be economic for harvest, and given that the site index adjustments had not been applied when making this deduction, may also prove economic for harvest in the future. Therefore, all else being equal, the long-term timber supply is likely greater than projected in the base case. The size of this increase cannot be quantified at this time.

- *site productivity in the ESSF* – Harvest history in the ESSF has not yet produced sufficient second-growth stands (old enough to provide a reliable site index estimate) to adequately verify the site index-elevation model applied in this biogeoclimatic zone. If the inventory estimates prove more accurate, long-term timber supply would be less than modelled,

- *not satisfactorily restocked areas* – I believe the incorrect classification of some partially cut stands as NSR has resulted in a marginal under-estimate of timber supply

In considering these factors I have concluded that on balance, the timber supply for TFL 8 projected in the base case is robust and that an increase in the AAC is appropriate. However, I am mindful that the licensee has expressed some concern regarding its own analysis assumptions and has therefore proposed a harvest level of 163 535 cubic metres per year. I am not compelled by any section in the Forest Act or the Minister's objectives to increase the AAC to the maximum extent possible. Therefore, to allow the licensee to verify and confirm its assumptions for the next determination, I have determined an AAC that is less than the short-term timber supply attained in the base case. Should the uncertainties in the assumptions underlying the base case be addressed for the next analysis, I will reflect this in the next determination.

With regard to First Nations interests, I am satisfied that I have adequately considered their stated interests and concerns, provided to me through the consultation process, in my determination.

Determination

I have considered and reviewed all the factors documented above, including the risks and uncertainties of the information provided. It is my determination that a timber harvest level that accommodates objectives for all forest resources during the next five years, that reflects current management practices as well as the socio-economic objectives of the Crown, and that does not unduly interfere with First Nations interests, can be best achieved on TFL 8 by establishing an AAC of 175 000 cubic metres per year. This represents an increase of 21 percent from the current AAC.

This determination is effective December 1, 2002 and will remain in effect until a new AAC is determined, which must take place within five years of the date of this determination, unless that date is formally postponed in the meantime under authority of Section 8 of the Forest Act.

If additional significant new information is made available to me, or major changes occur in the management assumptions upon which I have predicated this decision, then I am prepared to revisit this determination sooner than the five years required by legislation. I am particularly mindful of the First Nations issues I have discussed in this rationale and I will remain attuned to progress with those initiatives. If government should choose to make land-use decisions that prohibit harvesting on any of TFL 8, I will then consider a temporary or permanent reduction to this AAC at that time.

Implementation

In the period following this decision and leading to the next AAC determination, I request that the licensee:

- review the soils ESA classification and the terrain stability classification and ensure appropriate land base reductions for unstable terrain are applied in the next analysis;
- track and report the area harvested in the 8558 ha within the THLB currently classified as dense pine stands;
- in the next timber supply analysis, report the modelled output of harvested piece size and/or average harvested tree diameter;
- provide an operations-based estimate of residual uneconomic small patches that will be left across the landscape; and
- if possible, improve site index estimates in the ESSF biogeoclimatic zone.

Ken Baker

Ken Baker
Deputy Chief Forester

November 28, 2002

Appendix 1: Section 8 of the *Forest Act*

Section 8 of the *Forest Act*, Revised Statutes of British Columbia 1996, reads as follows:

Allowable annual cut

8. (1) The chief forester must determine an allowable annual cut at least once every 5 years after the date of the last determination, for

(a) the Crown land in each timber supply area, excluding tree farm licence areas, community forest areas and woodlot licence areas, and

(b) each tree farm licence area.

(2) If the minister

(a) makes an order under section 7 (b) respecting a timber supply area, or

(b) amends or enters into a tree farm licence to accomplish the result set out under section 39 (1) (a) to (d),

the chief forester must make an allowable annual cut determination under subsection (1) for the timber supply area or tree farm licence area

(c) within 5 years after the order under paragraph (a) or the amendment or entering into under paragraph (b), and

(d) after the determination under paragraph (c), at least once every 5 years after the date of the last determination.

(3) If

(a) the allowable annual cut for the tree farm licence area is reduced under section 9 (3), and

(b) the chief forester subsequently determines, under subsection (1) of this section, the allowable annual cut for the tree farm licence area,

the chief forester must determine an allowable annual cut at least once every 5 years from the date the allowable annual cut under subsection (1) of this section is effective under section 9 (6).

(3.1) If, in respect of the allowable annual cut for a timber supply area or tree farm licence area, the chief forester considers that the allowable annual cut that was determined under subsection (1) is not likely to be changed significantly with a new determination, then, despite subsections (1) to (3), the chief forester

(a) by written order may postpone the next determination under subsection (1) to a date that is up to 10 years after the date of the relevant last determination, and

(b) must give written reasons for the postponement.

(3.2) If the chief forester, having made an order under subsection (3.1), considers that because of changed circumstances the allowable annual cut that was determined under subsection (1) for a timber supply area or tree farm licence area is likely to be changed significantly with a new determination, he or she

(a) by written order may rescind the order made under subsection (3.1) and set an earlier date for the next determination under subsection (1), and

(b) must give written reasons for setting the earlier date.

(4) If the allowable annual cut for the tree farm licence area is reduced under section 9 (3), the chief forester is not required to make the determination under subsection (1) of this section at the times set out in subsection (1) or (2) (c) or (d), but must make that determination within one year after the chief forester determines that the holder is in compliance with section 9 (2).

(5) In determining an allowable annual cut under subsection (1) the chief forester may specify portions of the allowable annual cut attributable to

(a) different types of timber and terrain in different parts of Crown land within a timber supply area or tree farm licence area, and

(b) different types of timber and terrain in different parts of private land within a tree farm licence area,

(c) [Repealed 1999-10-1.]

(6) The regional manager or district manager must determine an allowable annual cut for each woodlot licence area, according to the licence.

(7) The regional manager or the regional manager's designate must determine a rate of timber harvesting for each community forest agreement area, in accordance with

(a) the community forest agreement, and

(b) any directions of the chief forester.

(8) In determining an allowable annual cut under subsection (1) the chief forester, despite anything to the contrary in an agreement listed in section 12, must consider

(a) the rate of timber production that may be sustained on the area, taking into account

(i) the composition of the forest and its expected rate of growth on the area,

(ii) the expected time that it will take the forest to become re-established on the area following denudation,

(iii) silviculture treatments to be applied to the area,

(iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area,

(v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production, and

(vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber,

(b) the short and long term implications to British Columbia of alternative rates of timber harvesting from the area,

(c) the nature, production capabilities and timber requirements of established and proposed timber processing facilities,

(d) the economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for British Columbia, and

(e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.

1998-29-2; 1999-10-1; 2000-6-2; 2002-25-21.

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Appendix 2: Section 4 of the *Ministry of Forests Act*

Section 4 of the *Ministry of Forests Act* (consolidated 1988) reads as follows:

Purposes and functions of ministry

4. The purposes and functions of the ministry are, under the direction of the minister, to

(a) encourage maximum productivity of the forest and range resources in British Columbia;

(b) manage, protect and conserve the forest and range resources of the government, having regard to the immediate and long term economic and social benefits they may confer on British Columbia;

(c) plan the use of the forest and range resources of the government, so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are co-ordinated and integrated, in consultation and co-operation with other ministries and agencies of the government and with the private sector;

(d) encourage a vigorous, efficient and world competitive timber processing industry in British Columbia; and

(e) assert the financial interest of the government in its forest and range resources in a systematic and equitable manner.

Documents attached:

Appendix 3: Minister of Forests' letter of July 28, 1994

Appendix 4: Minister of Forests' memo of February 26, 1996

File: 10100-01

JUL 2 8 1994

John Cuthbert
Chief Forester
Ministry of Forests
595 Pandora Avenue
Victoria, British Columbia
V8W 3E7

Dear John Cuthbert:

Re: Economic and Social Objectives of the Crown

The *Forest Act* gives you the clear responsibility for determining Allowable Annual Cuts, decisions with far-reaching implications for the province's economy. The *Forest Act* provides that you consider the social and economic objectives of the Crown, as expressed by me, in making these determinations. The purpose of this letter is to provide this information to you.

The social and economic objectives expressed below should be considered in conjunction with environmental considerations as reflected in the Forest Practices Code, which requires recognition and better protection of non-timber values such as biodiversity, wildlife and water quality.

The government's general social and economic objectives for the forest sector are made clear in the goals of the Forest Renewal Program. In relation to the Allowable Annual Cut determinations you must make, I would emphasize the particular importance the government attaches to the continued availability of good forest jobs and to the long-term stability of communities that rely on forests.

Through the Forest Renewal Plan, the government is taking the steps necessary to facilitate the transition to more value-based management in the forest and the forest sector. We feel that adjustment costs should be minimized wherever possible, and to this end, any decreases in allowable cut at this time should be no larger than are necessary to avoid compromising long-run sustainability.

.../2

Province of
British Columbia

Minister of
Forests

Parliament Buildings
Victoria, British Columbia
V8V 1X4

In addition to the provincial perspective, you should also consider important local social and economic objectives that may be derived from the public input on the Timber Supply Review discussion papers where these are consistent with the government's broader objectives.

Finally, I would note that improving economic conditions may make it possible to harvest timber which has typically not been used in the past. For example, use of wood from commercial thinnings and previously uneconomic areas may assist in maintaining harvests without violating forest practices constraints. I urge you to consider all available vehicles, such as partitioned cuts, which could provide the forest industry with the opportunity and incentive to demonstrate their ability to utilize such timber resources.

Yours truly,

Andrew Petter
Minister

Province of British Columbia
Ministry of Forests
OFFICE OF THE MINISTER

MEMORANDUM

File: 16290-01

February 26, 1996

To: Larry Pedersen
Chief Forester

From: The Honourable Andrew Petter
Minister of Forests

Re: **The Crown's Economic And Social Objectives Regarding Visual Resources**

Further to my letter of July 29, 1994, to your predecessor, wherein I expressed the economic and social objectives of the Crown in accordance with Section 7 of the *Forest Act*, I would like to elaborate upon these objectives as they relate to visual resources.

British Columbia's scenic landscapes are a part of its heritage and a resource base underlying much of its tourism industry. They also provide timber supplies that are of significant economic and social importance to forest industry dependent communities.

Accordingly, one of the Crown's objectives is to ensure an appropriate balance within timber supply areas and tree farm licence areas between protecting visual resources and minimizing the impact of such protection measures on timber supplies.

As you know, I have directed that the policy on management of scenic landscapes should be modified in light of the beneficial effects of the Forest Practices Code. In general, the new policy should ensure that establishment and administration of visual quality objectives is less restrictive on timber harvesting. This change is possible because alternative harvesting approaches as well as overall improvement in forest practices will result in reduced detrimental impacts on visually sensitive areas. Also, I anticipate that the Forest Practices Code will lead to a greater public awareness that forest harvesting is being conducted in a responsible, environmentally sound manner, and therefore to a decreased public reaction to its visible effects on the landscape. In relation to the Allowable Annual Cuts determinations that you make, please consider the effects that the new policy will have in each Timber Supply Area and Tree Farm Licence.

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In keeping with my earlier letter, I would re-emphasize the Crown's objectives to ensure community stability and minimize adjustment costs as the forest sector moves to more value-based management. I believe that the appropriate balance between timber and visual resources will be achieved if decisions are made consistent with the ministry's February 1996 report *The Forest Practices Code: Timber Supply Analysis.*

Finally, in my previous letter I had asked that local economic and social objectives be considered. Please ensure that local views on the balance between timber and visual resources are taken into account within the context of government's broader objectives.

Andrew Petter
Minister of Forests